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FULGHUM OATS

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THE FULGHUM OAT probably originated in southeastern Georgia about 20 years ago as a selection from the Red Rustproof variety. It differs from that variety chiefly in having fewer awns and in ripening about 10 days earlier.

It apparently is best adapted to parts of the winter-oat belt of the South and to the southwestern spring-oat section.

Results of experiments indicate that the yield of the Fulghum oat from fall sowing compares favorably with Red Rustproof in parts of North Carolina, South Carolina, and Georgia. In Alabama, Mississippi, and Arkansas it has not yielded as well as the Red Rustproof.

When fall sown in the northern portion of the winter-oat belt, neither the Fulghum nor the Red Rustproof has been able to compete with the hardy Winter Turf and Culberson varieties, as is indicated by the results of experiments at the Arlington Experimental Farm, Va., and at Fayetteville, Ark.

As a spring-sown oat, experiments in Arkansas, Missouri, and Kansas show that the Fulghum variety is adapted to that section and probably will replace the Burt. It is a most promising variety in Kansas.

Contribution from the Bureau of Plant Industry
WM. A. TAYLOR, Chief

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FULGHUM OATS.

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INTRODUCTION.

FULGHUM OATS are coming rapidly into favor in several sections of the United States. For fall sowing in the southern portion of the winter-oat belt they have become well established and are of considerable importance. Their value for spring sowing has not been definitely established. In the past few years, however, their culture from spring seeding has increased, particularly in those sections in which the principal spring-sown varieties have been limited to the Burt and Red Rustproof varieties.

Because the Fulghum oat is very similar in many characteristics to the well-known Red Rustproof (known also as the Appler, Bancroft, Cook, Damier, Ferguson No. 71, Hundred Bushel, Patterson, Red Texas) variety, some confusion has arisen regarding its identity. In a number of instances, Red Rustproof oats have been sold as seed of Fulghum, and occasionally the reverse has occurred.

HISTORY OF THE FULGHUM OAT.

The origin of the Fulghum oat is not definitely known. Prof. J. F. Duggar,[1] of the Alabama Agricultural Experiment Station, claims that this oat, or a similar one under the name Beardless Red, was grown at the South Carolina Agricultural Experiment Station (Clemson College) as early as 1892.[2] He reported that it was practically awnless and about 10 days earlier than the Red Rustproof. His observations are quoted as follows:

> The beardless Red Rustproof oat was apparently not pure, as shown by the irregularity in ripening and by the character of the grain. Besides grains of the usual Red Rustproof type, bearded, there were a few black grains and many yellow grains, the latter destitute of beards. The grains of this variety are smaller and less plump than the other red oats grown this season.

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[1] Duggar, J. F., and Cauthen, E. F. Oats; experiments on culture, varieties, and fertilization. Ala. Agr. Exp. Sta. Bul. 173, p. 133, 1913.

[2] Duggar, J. F. Experiments with oats and wheat. S. C. Agr. Exp. Sta. Bul. 7, p. 9, 1892.

The seed was obtained from a seed house in Richmond, Va., and several inquiries concerning the origin and sale of this seed have been addressed to this particular firm, but no definite information has been obtained. Other than this, nothing is known concerning its culture at that time.

About 1912 an awnless very early red oat under the name Fulghum was reported as being grown in southeastern Georgia. This oat originated on the farm of Mr. J. A. Fulghum, R. F. D. No. 4, Warrenton, Ga. In response to the request of Judge Henry C. Hammond, of Augusta, Ga., the following history of the variety was furnished to Mr. C. W. Warburton, agronomist in charge of oat investigations of the Bureau of Plant Industry, United States Department of Agriculture, by Mr. S. E. DuPuis, manager of the Warrenton mill of the Southern Cotton Oil Co., who obtained the statement from Mr. Fulghum:[3]

> About 20 years ago I was farming on a small scale and bought a lot of Texas Rustproof oats to sow 10 or more acres of poor, sandy piney-woods soil. I do not now remember from whom these oats were bought. In walking through the field one Sunday morning I noticed an oat plant about 200 yards away so much taller than the others that I went over to examine it. From a distance it looked like broom sedge, as it was 10 to 12 inches higher than the other oats and was fully ripe, while the others were just heading and still quite green. It was such an improvement over the rest of the field and looked so good that I picked the heads and kept them until seeding time the next fall. The seed from the five heads was sown in a row 30 feet long along the side of a field of oats. From this row a peck of oats was produced. The plants in this 30-foot row made an abundant crop and did not suffer for rain, while the yield of the remainder of the field was so small from lack of moisture at heading time that only a part of it was harvested. The peck of oats was sown in the garden and produced 10 bushels. The plants from these 10 bushels withstood the winter frost and the dry weather of spring. The fourth year 46 bushels were produced, of which 23 bushels were sold.
>
> This oat matures earlier than the Burt and is heavier than either the Rustproof or the Burt or any other oat I know. I have never tried to improve it further. I know that I kept it pure as long as I had it.

According to this statement, the strain of awnless red oats known as Fulghum originated as a selection from the Red Rustproof (Appler). Whether it appeared as a mixture in the Red Rustproof or as a selection from a natural hybrid between the Red Rustproof and some other variety is not known.

DESCRIPTION.

The Fulghum oat is a distinct variety of the red-oat group (*Avena sterilis* L.). It is vigorous, maturing about 10 days earlier than the Red Rustproof, and in the field is easily distinguished from that variety by its more erect heads (panicles). When sown in the fall the plants during the seedling stage are semierect in growth, being rather less spreading than those of the Red Rustproof. From spring sowing the young plants are semierect to erect, indicating that it originally was a spring variety. The culms are medium large and fairly stiff, with a reddish tinge like the other varieties of this group. The leaves are broad, medium long, and numerous. The heads, or panicles, are midsized, short branched, and very erect. The top spikelets in the heads frequently produce three grains. The kernels of the Fulghum are slightly shorter and not so plump as those of the Red Rustproof variety. They usually are free from the awns (beards) and basal hairs which are so characteristic of Red Rustproof oats. The color of the Fulghum oat is a rich buff, if harvested and thrashed without discoloration from weathering. Under ordinary humid conditions in the Southeastern States the grain of the Fulghum and of the Red Rustproof may be said to be yellowish red and brownish red, respectively.

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[3] Letter of S. E. DePuis, Warrenton, Ga., dated January 18, 1917.

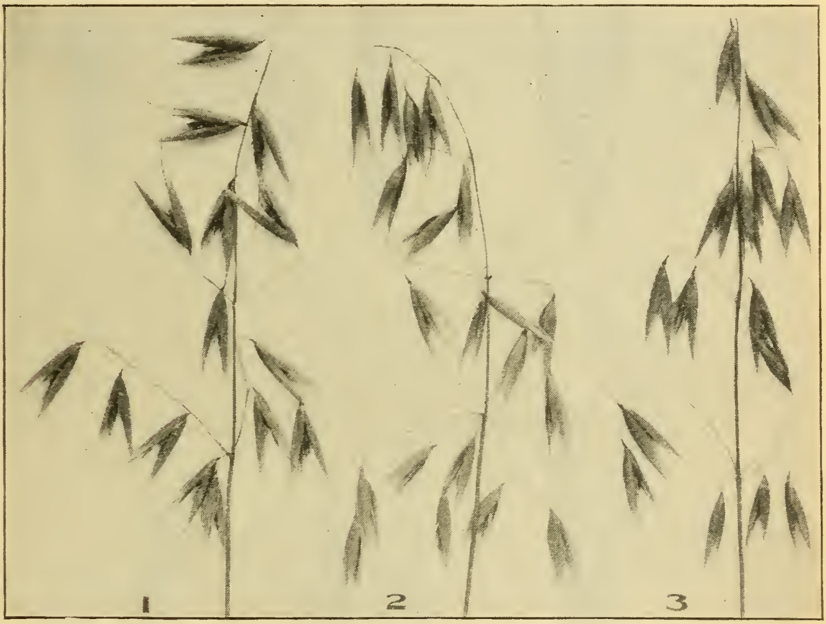

FIG. 1.—Panicles (heads) of three varieties of red oats: (1) Red Rustproof, (2) Burt, and (3) Fulghum.

The Fulghum oat is rarely confused with the Burt. The long slender kernels of the Burt serve to distinguish it clearly from the Fulghum. The Burt also has a taller and more slender stem (culm) and is less uniform in growth and appearance.

Like the other varieties of red oats, the Fulghum is resistant to smut and is also somewhat resistant to leaf rust. Panicles and spikelets of the Fulghum, Red Rustproof, and Burt oats are shown in figures 1 and 2.

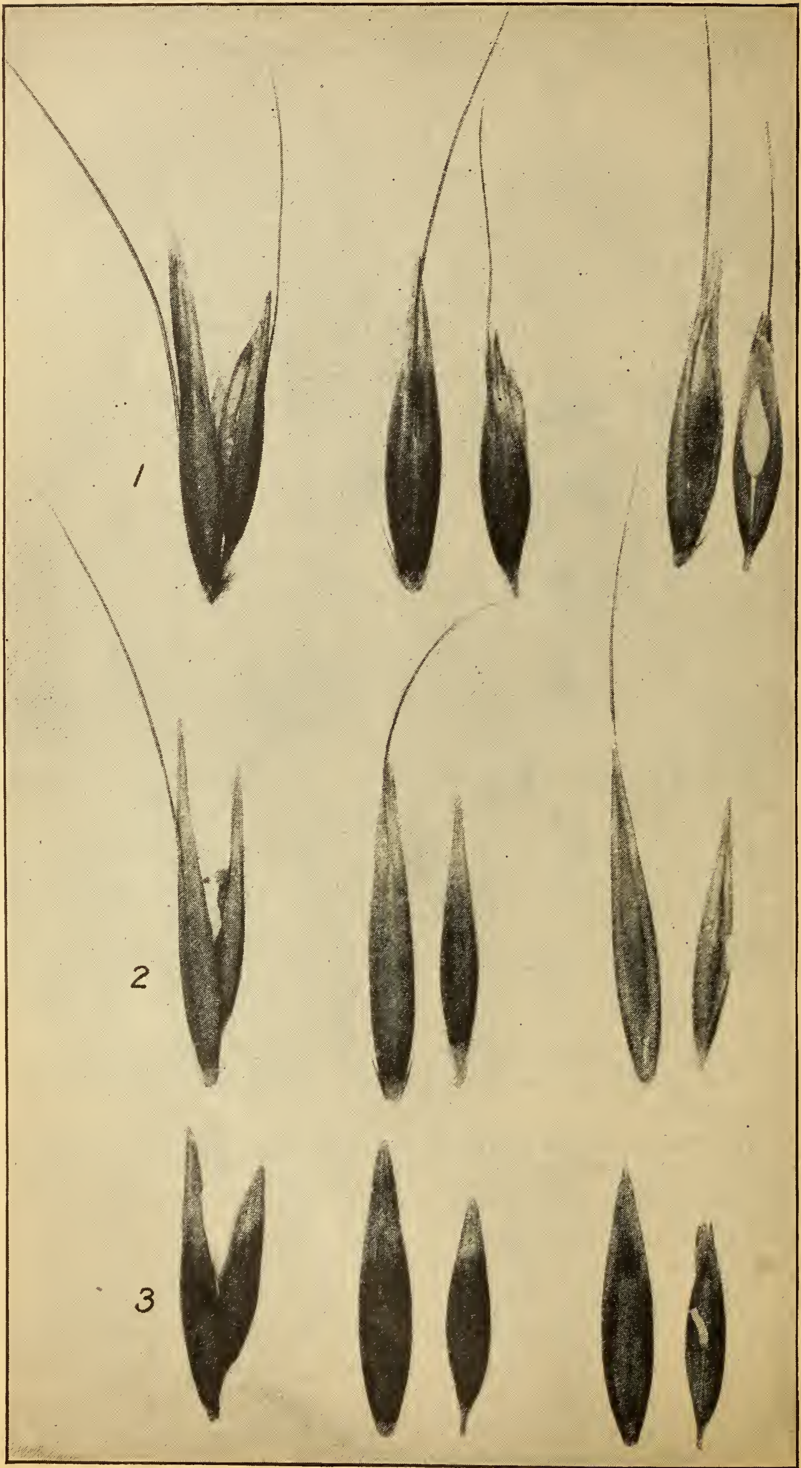

FIG. 2.—Spikelets of three varieties of red oats: (1) Red Rustproof, (2) Burt, and (3) Fulghum

AREAS WHERE ADAPTED.

The Fulghum oat, like the other varieties, is adapted to a rather wide range of soil and of climate. It appears, however, to be best adapted to parts of the winter-oat belt of the South and to the southwestern spring-oat section. The indications are that it will eventually become of much more importance for spring than for fall sowing.

This oat is now grown rather extensively from fall sowing in those districts of South Carolina, Georgia, Alabama, Mississippi, Louisiana, and Texas in which it is able to compete in yield with the Red Rustproof variety.

The Fulghum probably has a wider adaptation than the Red Rustproof as a spring-sown variety. In those sections in which the Red Rustproof and Burt have been the leading spring-sown varieties it does well. Its value for spring sowing is becoming more apparent each year in much of the northern portion of the cotton belt, including parts of North Carolina, Tennessee, Arkansas, and Texas, and in the southern portion of the corn belt, including the southern parts of Ohio, Indiana, and Illinois in addition to Kentucky, Missouri, Kansas, and Oklahoma. It is probable that it will prove most useful in Arkansas, Missouri, Kansas, Oklahoma, and northern Texas. In these States it will replace the Burt, which never has been a satisfactory variety from the standpoint of quality and uniformity.

YIELD.

The value of a new variety of a crop plant depends primarily upon several factors, the most important of which are (1) its adaptability to certain soil and climatic conditions and (2) its yield and quality as compared with old well-established sorts. The results obtained so far with the Fulghum oat from fall sowing and from spring sowing will be considered in the order mentioned.

RESULTS FROM FALL SOWING.

A number of varietal experiments including the Fulghum oat have been conducted by the different agricultural experiment stations in the Southern States during the past few years. The United States Department of Agriculture has conducted experiments with these oats at the Arlington Experimental Farm, Va., near Washington, D. C., and also at several points in Georgia in cooperation with the Georgia State College of Agriculture. A summary of the yield data obtained at 11 experiment stations in 5 Southern States is presented in Table I.

Table I shows that there is no marked difference in yield between the Fulghum and Red Rustproof oats grown at the Arlington Experimental Farm, Va., and at Athens, Ga., where the experiments have been conducted long enough to be conclusive. At Athens during a 9-year period the Red Rustproof has exceeded the Fulghum by only 1.5 bushels in average yield. However, there is a marked difference in yield in favor of the Red Rustproof at several stations where the experiments have been of sufficient duration to be indicative, if not conclusive. Among these stations are Auburn, Ala., Agricultural College, Miss., and Fayetteville, Ark.

TABLE I.—*Average yields of the highest yielding strain of the Fulghum and four other varieties of oats grown from fall seeding during periods varying from one to nine years at eleven experiment stations in five Southern States.*

State and location of station.	Number of years grown.	Years in which data were obtained.	Average yield per acre.				
			Fulghum.	Red Rustproof.[a]	Winter Turf.	Culberson.	Burt (Early Ripe).
			Bushels.	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*
Virginia:							
Arlington Farm	6	1914 to 1919.	48.5	[b] 48.2	59.2	[c] 55.5	....
North Carolina:[d]							
Statesville	1	1914	34.8	29.6	15.4	....	29.5
Georgia:[e]							
Athens	9	1912 to 1920.	48.0	49.5	[f] 44.0	41.4	35.0
Auburn	2	1915 and 1916.	50.8	37.9	14.4	27.0	48.4
Douglas	1	1918	10.3	18.4	....	16.7	10.6
Quitman	3	1915 to 1917.	22.8	23.7	[g] 12.1	16.0	18.8
Register	1	1919	14.7	17.5	9.0	....	....
Tifton	4	1917 to 1920.	25.6	32.4	....	18.1	[h] 20.2
Alabama:[i]							
Auburn	2	1912 and 1913.	20.6	37.9	....	....	21.9
Mississippi:[j]							
Agricultural College	3	1911, 1912, and 1914.	36.2	43.3	36.1	....	36.0
Arkansas:[k]							
Fayetteville	4	1916 to 1919.	14.7	30.7	35.2	39.8	[g] 15.9

[a] The highest average yield in some instances was not made by Red Rustproof as such but by a named strain of it, such as Appler, Cook, Hastings, and Bancroft.

[b] Five-year average; the yield in 1918 was not comparable.

[c] Average of 63 check plats.

[d] Garren, G. M. Results of variety tests of wheat, oats and rye. N. C. Agr. Exp. Sta. Bul. 232, 28 p. 1915.

[e] Data obtained in cooperation with the Georgia State College of Agriculture of the University of Georgia.

[f] Eight-year average; not grown in 1917.

[g] Two-year average.

[h] Three-year average.

[i] Duggar, J. F., and Cauthen, E. F. Oats; experiments on culture, varieties, and fertilization. Ala. Agr. Exp. Sta. Bul. 173, p. 133. 1913.

[j] Ricks, J. R. Experiments with small grains. Miss. Agr. Exp. Sta. Bul. 171, 12 p. 1915.

[k] Nelson, Martin, and Osborn, L. W. Report of oats experiments, 1908–1919. Ark. Agr. Exp. Sta. Bul. 165, 32 p. incl. 2 pl. 1920.

At both the Arlington Experimental Farm, Va., in the vicinity of Washington, D. C., and the Agricultural Experiment Station at Fayetteville, Ark., neither the Fulghum nor the Red Rustproof has been able to compete with the more hardy Winter Turf and Culberson varieties. The superiority of these last-mentioned varieties for the northern portion of the winter-oat belt is clearly indicated in the average yields obtained at these stations. Of the red-oat types, the Burt has fallen considerably below both the Fulghum and the Red Rustproof in yield in most instances. It is not a satisfactory variety for fall sowing.

RESULTS FROM SPRING SOWING.

It is only within the past few years that the Fulghum oat has begun to attract attention as a spring-sown variety. For this reason comparatively few data on varietal experiments which have included the Fulghum oat are yet available. The Kansas Agricultural Experiment Station was among the first to discover that the Fulghum was of promise as a spring oat in that section. It was first grown in the varietal experiments at that station in 1917 under the name of "Nicholson's Improved Extra-Early Red Rustproof." It was so promising in the early experiments that the station officials decided to distribute it to different sections of the State. Before doing so, however, they desired a shorter name for it. Consequently, a sample was sent to the Office of Cereal Investigations of the Bureau of Plant Industry for identification and suggestions regarding a suitable name. It was there identified as the Fulghum oat and was accessioned under Cereal Investigations No. 839. Correspondence between Prof. J. H. Parker, of the Kansas Agricultural Experiment Station, and Mr. Robert Nicholson, of Dallas, Tex., from whom the seed was originally obtained, brought out the fact that the seed of this particular strain was obtained from southern Georgia, where the Fulghum originated. This strain of Fulghum is being distributed in Kansas under the name Kansas Fulghum. It was named Kanota by the Kansas station in the summer of 1921 and will be distributed under that name in the future.

Summarized yield data from varietal experiments, including the Fulghum, Red Rustproof, Burt, and several other varieties of oats from spring sowing at Manhattan and Hays, Kans., Columbia, Mo., and Fayetteville, Ark., are presented in Table II.

TABLE II.—*Average yields of the highest yielding strain of the Fulghum and five other varieties of oats grown from spring sowing during periods varying from one to four years at four experiment stations in three States in the southwestern spring-oat section.*

State and location of station.	Number of years grown.	Years in which data were obtained.	Average yield per acre.					
			Fulghum.	Red Rustproof.	Burt.	Kherson or Sixty-Day.[a]	Early Champion.	Silvermine or similar type.
Kansas:[b]			*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*	*Bushels.*
Manhattan....	4	1917 to 1920.	47.1	36.3	38.2	34.9	....	....
Hays..........	2	1919 and 1920.	57.7	....	[c] 49.3	44.8	....	....
Missouri:[d]								
Columbia.....	1	1920........	33.4	31.2	35.9	38.7	33.1	30.7
Arkansas:[e]								
Fayetteville...	4	1916 to 1919.	42.3	39.7	41.7	41.2	29.5	25.4

[a] Including selections such as the Albion (Iowa No. 103) and Richland (Iowa No. 105).
[b] Data obtained in cooperation with the Kansas Agricultural Experiment Station.
[c] Yield of a hybrid of Burt and Sixty-Day.
[d] Data obtained in cooperation with the Missouri Agricultural Experiment Station.
[e] Nelson, Martin, and Osborn, L. W. Report of oats experiments, 1908–1919. Ark. Agr. Exp. Sta. Bul. 165, 32 pp. incl. 2 pls. 1920.

The data presented in Table II are too meager to be conclusive, with the exception of those obtained at Manhattan, Kans. They indicate, however, that the Fulghum will yield as well as or better than the Red Rustproof or Burt variety in the southern section of the spring-oat belt. At Manhattan and Hays, Kans., and at Fayetteville, Ark., the Fulghum leads in yield, with strains of the Kherson or Sixty-Day taking second place.

The following brief statement regarding the value of Fulghum oats for Ohio was contained in a letter to the Office of Foreign Seed and Plant Introduction under date of March 24, 1920, by Prof. J. B. Park, of the Ohio State University:

> Fulghum oats, a small sample of which was secured from the Bureau of Plant Industry about four years ago, has proved to be, by all odds, the highest yielding variety that we have in our tests here at Columbus. This year it yielded 10 bushels per acre more than our next highest variety.[4]

QUALITY.

The Fulghum oat usually produces grain of good quality. In weight per bushel it generally exceeds the Red Rustproof, primarily because it packs more closely, owing to the almost complete absence of awns and basal hairs. At the Arlington Experimental Farm, Va., the difference in bushel weight in favor of the Fulghum variety has been slight, while several strains of the Winter Turf oat have shown a higher bushel weight than the Fulghum. In southern Georgia and other sections of the South where the Fulghum is grown extensively, the bushel weight usually is higher than that of the Red Rustproof. When grown as a spring variety in Kansas and other States to which red oats are best adapted, the Fulghum is greatly superior to the Burt in quality and weight per bushel and usually is better than the Red Rustproof.

TIME OF RIPENING.

One of the most desirable characteristics of the Fulghum oat is its earliness. When grown from fall seeding in the South it ripens 10 days to two weeks earlier than the Red Rustproof, Appler, Bancroft, and others. This is a decided advantage in giving more time for preparation of the land, sowing, and growth of the succeeding crop. Oats require rather cool weather for their best development, and those varieties that mature earliest usually yield best, especially in the South.

At the Arlington Experimental Farm, Va., the Fulghum oat has matured from a week to 10 days earlier than the Red Rustproof.

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[4] Since this manuscript was submitted for publication, copies of the Monthly Bulletin of the Ohio Agricultural Experiment Station for March-April, 1921, have been received, in which the results of varietal experiments covering a period of three years with oats at Columbus are summarized. This summary shows that in the three years (1918–1920) during which it has been grown the Fulghum has outyielded all other varieties, exceeding the Big Four, its nearest competitor, by 2.6 bushels to the acre.

In Georgia, where the Fulghum is grown rather extensively from fall seeding, it usually ripens about 10 days in advance of the Red Rustproof, and in Alabama the difference is about the same. At Manhattan, Kans., the Fulghum oat on the average ripens about six days in advance of the Red Rustproof. In Arkansas, fall-sown Fulghum ripens about one week earlier than the Culberson and about two weeks earlier than the Red Rustproof varieties. From spring sowing it matures at the same time as the Burt and a week to 10 days ahead of the Red Rustproof.

SOURCES OF SEED.

In the southern winter-oat section seed of the Fulghum variety is not difficult to obtain. Practically all the seedsmen in that section who handle farm seeds can supply Fulghum oats of fair to good quality. Because of the fact that the Fulghum is yet to a large extent an untried variety on the farms in the southern part of the spring-oat sections, the sources from which adapted seed can be obtained are not numerous. The Kansas Agricultural Experiment Station in 1920 distributed seed of the Kansas Fulghum to 30 farmers in different sections of the State. If it continues to be as promising as the results of these 30 tests indicate, ample supplies of seed soon will be available for sowing in Kansas and the adjoining States. Seed of the Fulghum oat from the southern winter-oat section may be obtained at practically all times. Seed from the fall-sown crop is hardly as satisfactory as that from the home-grown spring-sown crop for spring seeding, and there is also serious danger of introducing Johnson grass with southern oats.

How To Do It

DO YOU WANT practical suggestions on how to build a silo, a hog house, a poultry house, a potato-storage house, or how to make a fireless cooker or other farm home convenience, a flytrap, or a self-feeder for hogs? Are you seeking ideas on how to prepare vegetables for the table, how to care for food in the home, how to bake bread and cake and other appetizing foods in an efficient and economical manner? Is there some practical question about your corn or wheat or cotton or other crops, or about your poultry or live stock, to which you are seeking an answer? The answers to thousands of such questions, with practical suggestions for doing thousands of things about the farm and home, are contained in over 500 Farmers' Bulletins, which can be obtained upon application to the Division of Publications, United States Department of Agriculture, Washington, D. C.